

AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth below in marked-up form. This listing of claims will replace all prior versions and listings of claims in the application.

1. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture, comprising:

a carrier tube;

a filament;

an anchor configured to be inserted through the tissue puncture, the anchor being attached to the filament at a first end of the closure device;

a sealing plug positioned in the carrier tube, the sealing plug comprising:

a first plurality of holes including one hole in the sealing plug, the first plurality of holes forming a first weave pattern in a first portion of the sealing plug, wherein a first portion of the filament extends from a first side of the anchor and passes through the first plurality of holes;

a second plurality of holes including another hole in the sealing plug, the second plurality of holes forming a second weave pattern in a second portion of the sealing plug, wherein a second portion of the filament extends from a second side of the anchor and passes through the second plurality of holes;

wherein the filament passes through the one hole in the sealing plug to a hole in the anchor and back through the another hole in the sealing plug;

wherein the one hole in the sealing plug is the last hole in the sealing plug that the filament passes through before entering the hole in the anchor and the another hole in the sealing

plug is the first hole in the sealing plug that the filament passes through after exiting the hole in the anchor; and

wherein the filament passes through at least four holes in the sealing plug.

2. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 1 wherein the sealing plug is folded at least twice.

3. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 2 wherein the sealing plug is shaped at least approximately like an S.

4. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 1 wherein the sealing plug is folded.

5. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 4 wherein the sealing plug is folded between the one hole in the sealing plug and the another hole in the sealing plug.

6. (Canceled)

7. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 1 wherein the first weave pattern and the second weave pattern each comprise a five-hole zigzag arrangement.

8. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 1 wherein the sealing plug and filament each comprise biologically resorbable materials.

9. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 1 wherein the sealing plug is folded between the first weave pattern and the second weave pattern.

10. (Original) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 1 wherein the sealing plug shape comprises an X-shape in cross-section.

11. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 10, further comprising a plurality of holes including the one hole in the sealing plug and the another hole in the sealing plug, the plurality of holes forming a staggered weave pattern in the sealing plug.

12. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 10 wherein the filament alternately passes through generally perpendicular walls of the sealing plug.

13. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 12 wherein the plurality of holes includes a first set of equally longitudinally spaced hole pairs in one of the perpendicular walls and a second set of equally longitudinally spaced hole pairs in another one of the perpendicular walls, the second set of hole pairs being staggered from the first set of hole pairs longitudinally.

14. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 1 wherein the sealing plug shape comprises two components, and wherein the one hole in the sealing plug is in one of the two components and the another hole in the sealing plug is in the other one of the two components.

15. (Previously Presented) A tissue puncture sealing device, comprising:

an internal component configured to be positioned against an internal wall of a bodily lumen, the internal component comprising a stiff member;

an external component configured to be positioned external to the lumen, the external component being folded so that one portion of the external component is in contact with another portion of the external component, the external component comprising a sponge material;

wherein the external component is operatively connected to the internal component by a filament configured to compress and hold the internal and external components together to prevent fluid from passing through a puncture in the bodily lumen;

wherein the filament passes through one hole in the external component to a hole in the internal component and back through another hole in the external component, the external component being folded between the one hole in the external component and the another hole in the external component;

wherein the filament only passes once through each one of the one hole and the another hole; and

wherein the tissue puncture sealing device is in an undeployed configuration.

16. (Previously Presented) A tissue puncture sealing device according to claim 15

wherein the internal component is a stiff anchor and the external component is a collagen sponge.

17. (Original) A tissue puncture sealing device according to claim 16 wherein the collagen sponge is folded twice longitudinally.

18. (Original) A tissue puncture sealing device according to claim 17 wherein the collagen sponge is substantially S-shaped.

19. (Previously Presented) A tissue puncture sealing device according to claim 15 wherein the external component comprises a plurality of holes including the one hole in the external component and the another hole in the external component, wherein the plurality of holes form a weave pattern, and wherein the filament weaves through a first portion of the weave pattern, through the internal component, and back through a second portion of the weave pattern.

20. (Previously Presented) A tissue puncture sealing device according to claim 19 wherein the external component is folded between the first portion of the weave pattern and the second portion of the weave pattern.

21. (Previously Presented) A tissue puncture sealing device according to claim 15 wherein the external component comprises two legs folded along a centerline such that the two legs are substantially aligned.

22. (Previously Presented) A tissue puncture sealing device according to claim 19 wherein the external component is folded latitudinally.

23. (Previously Presented) A tissue puncture sealing device according to claim 15, wherein the external component includes a first external component and a second external component, the second external component being folded and in contact with the first external component.

24. (Original) A tissue puncture sealing device according to claim 23 wherein the first and second external components are each folded into generally U-shapes.

25. (Previously Presented) An internal tissue puncture closure device, comprising:
an anchor for insertion through a tissue puncture;
a filament threaded through the anchor;
a flexible sealing plug attached to the anchor by the filament;
wherein the sealing plug comprises two cross members each of which includes a plurality of holes which extend therethrough;
wherein the filament extends through the plurality of holes in each of the two cross members;
wherein the filament alternately extends through the plurality of holes in the two cross members in a spiral pattern; and
wherein the tissue puncture sealing device is configured so that applying a tension force to the filament moves the anchor and the sealing plug together.

26. (Previously Presented) An internal tissue puncture closure device according to claim 25 wherein the two cross members are arranged in a generally X-shape.

27. (Original) An internal tissue puncture closure device according to claim 26 wherein each of two portions of the filament extending from the anchor in opposite directions traverse separate holes through the two cross members.

28. (Currently Amended) A tissue puncture sealing device, comprising:

a filament;

an anchor attached to the filament and configured to be inserted through a tissue wall puncture; and

a sealing plug disposed proximal of the anchor, the sealing plug including a first plurality of openings and a second plurality of openings;

wherein the filament passes through at least two openings from the first plurality of openings, through the anchor, and back through at least two openings from the second plurality of openings;

wherein the sealing plug is tri-folded into substantially an S-shape ~~as seen from an end view, wherein each fold is aligned substantially parallel with a longitudinal axis of the sealing~~ plug; and

wherein the filament weaves between the anchor and the first plurality of openings in a nonlinear pattern.

29. (Previously Presented) A tissue puncture sealing device according to claim 28 wherein the sealing plug is folded and the tissue puncture sealing device is in an undeployed configuration.

30. (Previously Presented) A tissue puncture sealing device according to claim 28 wherein the sealing plug has two legs that form an at least approximately symmetrical shape, and wherein the first plurality of openings are in one leg and the second plurality of openings are in another leg.

31. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture, comprising:

an insertion sheath having first and second ends;

a carrier tube disposed inside the insertion sheath, the carrier tube having first and second ends;

an anchor disposed inside the insertion sheath at the first end thereof, the anchor being disposed outside of the carrier tube at the first end thereof, wherein a portion of the anchor is positioned radially adjacent to an outer diameter of the carrier tube;

a sealing plug disposed inside the carrier tube at the first end thereof;

wherein the sealing plug is folded at least once; and

wherein the tissue puncture closure device is in an undeployed configuration where the tissue puncture closure device is not inserted into a patient.

32. (Currently Amended) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 31 wherein the sealing plug is tri-folded into an S-shape ~~as seen from an end view, wherein each fold is aligned substantially~~ parallel with a longitudinal axis of the sealing plug.

33. (Original) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture according to claim 31 wherein the sealing plug is folded from an original V-shape to a rectangular shape.

34-36. (Canceled)

37. (Previously Presented) A method of sealing an internal tissue puncture, comprising:

inserting a closure device partially into the internal tissue puncture, the closure device including a carrier tube, an anchor, and a sealing plug, the closure device being in an undeployed configuration before being inserted into a patient where, in the undeployed configuration, the anchor is positioned outside of the carrier tube such that a portion of the anchor is positioned radially adjacent to an outer diameter of the carrier tube, the portion of the anchor being flush with the outer diameter of the carrier tube, wherein the sealing plug is positioned inside the carrier tube and is folded so that one portion of the sealing plug is in contact with another portion of the sealing plug.

deploying the anchor;

filling the internal tissue puncture with the sealing plug;

compressing the sealing plug and the anchor across the internal tissue puncture.

38. (Original) A method of sealing an internal tissue puncture according to claim 37, further comprising inserting the closure device into an insertion sheath.

39. (Previously Presented) A method of sealing an internal tissue puncture according to claim 37 wherein the sealing plug has a V-shape when it is unfolded.

40. (Previously Presented) A method of sealing an internal tissue puncture according to claim 37 wherein the sealing plug is folded latitudinally.

41. (Canceled)

42. (Previously Presented) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture, comprising:

a carrier tube;

an anchor positioned outside of the carrier tube;

a sealing plug disposed inside the carrier tube; and

a filament configured to couple the anchor and the sealing plug together;

wherein the sealing plug is folded at least once so that one portion of the sealing plug is in contact with another portion of the sealing plug;

wherein a portion of the anchor is positioned radially adjacent to an outer diameter of the carrier tube such that the portion of the anchor is flush with the outer diameter of the carrier tube;

wherein the tissue puncture closure device is in an undeployed configuration where the tissue puncture closure device is not inserted into a patient.

43. (Currently Amended) A tissue puncture closure device, comprising:
an anchor configured to be inserted through a tissue puncture;
a sealing plug that is compressible; and
a filament configured to couple the anchor and the sealing plug together, the sealing plug
being configured to compress when a tension force is applied to the filament;
wherein the sealing plug is generally X-shaped in cross section;
wherein the sealing plug comprises two cross members which form the X-shaped sealing
plug cross section; and
wherein the filament alternately extends through holes in the two cross members in a
spiral pattern.

44. (Canceled)

45. (Currently Amended) A tissue puncture closure device for partial insertion into and sealing of an internal tissue wall puncture, comprising:

a filament;

an anchor; and

a sealing plug that is generally V-shaped when the sealing plug is open, and laid out flat, and unfolded;

wherein the generally V-shaped sealing plug comprises a plurality of holes extending therethrough;

wherein the tissue puncture closure device is in an undeployed configuration; and

wherein the tissue puncture closure device is configured so that applying a tension force to the filament compresses and holds the sealing plug and the anchor together.

46. (Previously Presented) The tissue puncture closure device of claim 45 wherein the sealing plug is folded at least once.

47. (Previously Presented) A tissue puncture closure device, comprising:

a carrier tube;

an anchor configured to be inserted through a tissue puncture, the anchor comprising a stiff member;

a sealing plug that is compressible, the sealing plug comprising a sponge material; and

a filament configured to couple the anchor and the sealing plug together;

wherein the filament passes through one hole in the sealing plug, through a hole in the anchor, and back through another hole in the sealing plug, wherein the filament only passes once through each one of the one hole and the another hole; and

wherein the sealing plug is positioned in the carrier tube in an undeployed configuration;

and

wherein the one hole is in one leg portion of the sealing plug and the another hole is in another leg portion of the sealing plug.

48. (Previously Presented) The tissue puncture closure device of claim 47 wherein the sealing plug comprises a first plurality of holes including the one hole in the sealing plug and a second plurality of holes including the another hole in the sealing plug, and wherein the filament passes through the first plurality of holes, through the hole in the anchor, and back through the second plurality of holes.

49. (Previously Presented) The tissue puncture closure device of claim 47 wherein the sealing plug is folded.

50. (Previously Presented) The tissue puncture closure device of claim 47 wherein the sealing plug is folded between the one hole in the sealing plug and the another hole in the sealing plug.

51. (Previously Presented) The tissue puncture closure device of claim 47 wherein the one leg and the another leg form at least two portions that are symmetrical and are folded together, the sealing plug comprising a first plurality of holes in one of the at least two symmetrical portions and a second plurality of holes in another one of the at least two symmetrical portions, the first plurality of holes including the one hole and the second plurality of holes including the another hole, and wherein the filament extends through the first plurality of holes in the one symmetrical portion, through the hole in the anchor, and back through the second plurality of holes in the another symmetrical portion.

52. (Previously Presented) The tissue puncture closure device of claim 47 wherein the tissue puncture closure device is a vascular puncture closure device, wherein the anchor is configured to be inserted through an opening in a blood vessel and the sealing plug is configured to be positioned opposite the anchor outside of the blood vessel, and wherein the filament is configured to couple the anchor and the sealing plug together across the opening in the blood vessel.

53. (Previously Presented) A tissue puncture closure device, comprising:

an anchor configured to be inserted through a tissue puncture;

a sealing plug including a first component and a second component, the first component being separate from the second component; and

a filament configured to couple the anchor and the sealing plug together when the anchor and the sealing plug are deployed;

wherein the first component and the second component each have a general U-shape;

wherein the filament passes through one hole in the first component and one hole in the second component before passing through a hole in the anchor and wherein the filament passes through another hole in the first component and another hole in the second component after passing through the hole in the anchor.

54. (Previously Presented) The tissue puncture closure device of claim 53 wherein the first component and the second component are positioned in an interconnected relationship to each other.

55. (Canceled)